

Zero Retries 0239

2026-02-20 - N8GNJ's Top 3 Priorities for ZR Interesting Amateur Radio in the Next 3 Years, Geocaching Idea, MOP - Mesh Operations Protocol, Quantum SDR Project, MSeven - M17 App for iPad

Steve Stroh N8GNJ

Zero Retries is an independent newsletter promoting technological innovation in and adjacent to Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Radios are computers - with antennas! Now in its fifth year of publication, with 3500+ subscribers.

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This issue of Zero Retries was originally published on Ghost - <https://www.zeroretries.radio/zero-retries-0239/>. Thus all links that were for zeroretries.radio have (attempted to) been changed to equivalents on zeroretries.org.

See this archive page:

<https://web.archive.org/web/20260412225517/https://www.zeroretries.radio/zero-retries-0239/>
for how it originally appeared on www.zeroretries.radio.

Substack says this issue is **too big for email clients**. Thus, it might be easier to read this in a web browser - <https://www.zeroretries.org/p/zero-retries-0239-f64>.

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Request To Send

Paid Subscribers Update

My thanks to **Prefers to Remain Anonymous 65** for *renewing* as an **Annual Paid Subscriber** to Zero Retries this past week!

My thanks to **Prefers to Remain Anonymous 123** for *upgrading* from a free subscriber to Zero Retries to a **Paid Subscriber** this past week!

Financial support from Zero Retries readers is a significant vote of support for the continued publication of Zero Retries.

No More Fable Of Contents

Apologies, folks. Labeling the contents section when I began publishing on Ghost as **Fable of Contents** was deliberate, and was intended as a homage to my first professional writing stint in [Boardwatch Magazine](#). "Fable" was decreed by Boardwatch's founder and "Editor Rotundus" Jack Rickard. He once explained that the content mix in Boardwatch was so dynamic (chaotic) in the heady days of the newly commercialized and publicly accessible Internet resulted in so many ads pouring into Boardwatch that sometimes the Table of Contents didn't match the actual articles, page

numbers, etc. Thus, *Fable of Contents* became one of the long running inside jokes for long time Boardwatch readers. Another one was “Broadwatch”, but that’s a tale for another time.

I was recently asked about my usage of *Fable of Contents*, and in a moment of blinding realization, that usage here in *Zero Retries* didn’t seem that funny, or relevant, just confusing, so I’ve discontinued that, and updated the web versions of the last few issues.

(Invalid) Security Warnings for www.zeroretries.radio - Part 2

Post Publication Update 2 - *If you’re reading this after 2026-04-03, the conversion to **Ghost** / www.zeroretries.radio didn’t work out and Zero Retries is again being published on Substack / www.zeroretries.org. Thus the info in this section is retained solely for historical reference.*

Post Publication Update 1 - *This should have been obvious to me, but if you’re reading this on www.zeroretries.radio, you’ve been able to access this info and understand the situation. But those who cannot access www.zeroretries.radio **cannot** see this information. Thus I created a post on Substack (which generated an email to those still on Substack Zero Retries - www.zeroretries.org) that explains the situation in more detail.*

[Invalid Security Issues with \[www.zeroretries.radio\]\(http://www.zeroretries.radio\) Published on Ghost](#)

Some readers are still reporting issues accessing Zero Retries’ new website (published on Ghost, using the **www.zeroretries.radio** domain).

This week, Ghost Technical Support finally provided some clarity on the root cause of the issue:

Our engineers have had a look at this, and were able to determine that the site was marked as a phishing site by Cloudflare, as well as other providers.

You can see the results of a search here: <https://www.virustotal.com/gui/url/b3a93580ea03db32ac5fec58a5b92149f35d300e00adeeae9326cb51367e5581/detection>

While [Ghost has] applied to have this block removed (by Cloudflare, as we work with them), we aren’t able to easily remove this from the rest of those blocking it.

The reason it is sometimes returning a block for users, vs not loading for others, is because some users would have it being blocked at the DNS level (failing to load at all) vs the browser level (the red page these members are seeing).

As to *why* the site is being marked as “phishing” by some locations, is another issue. I do not see anything “malicious” on the site, though with newer TLD domain extensions I do know there are some restrictions. For example, a .radio domain seems that it should be utilized for those in the “Radio” industry (e.g. broadcasters, radio journalists, and related services). When doing some digging on this, it does seem like that may be a potential reason for being marked as phishing.

Thus the issue seems to boil down to “fear of phishing”, as determined by (*I really don’t know...*) and manifesting in varying ways in some browsers, on some (PC?) security systems. Some readers have been able to “whitelist” www.zeroretries.radio with no further impact, but others report that they don’t have that ability.

To be clear, *I’m not minimizing / trivializing / dismissing* the experience and caution of those who have reported this issue. But please understand, these issues are not universal.

For example, three of the browsers I have installed on my Mac - Safari, Firefox, DuckDuckGo, are working fine. But (Mac) *Chrome* has a major issue with accessing www.zeroretries.radio:

This site can't be reached
www.zeroretries.radio refused to connect.
ERR_CONNECTION_REFUSED

(Yes, I've tinkered with Chrome's various security settings, and no joy at all.) Given the experience with the other three browsers, that message is clearly specious.

As far as I can tell, I'm doing everything right in setting up publication of Zero Retries on Ghost and dot Radio domains to use www.zeroretries.radio, which Ghost's technical support has confirmed.

If you'd like to interact about this issue, [please do so on the Zero Retries email list](#).

Thus I don't plan any changes at the moment, such as migrating to a different domain name (I really like zeroretries.radio...), and I do plan to continue to migrate all Zero Retries content to Ghost.

The Saga of Conversion to Ghost and zeroretries.radio - Part 6

Post Publication Update - *If you're reading this after 2026-04-03, the conversion to **Ghost** / **www.zeroretries.radio** didn't work out and Zero Retries is again being published on Substack / **www.zeroretries.org**. Thus the info in this section is retained solely for historical reference.*

I had to wait all week for the above *not-exactly-a-resolution* from Ghost and thus out of fear that something fundamental would need to be changed, I didn't pull the trigger on mass import of email addresses from Substack, and attempted migration of all the Substack content.

Now that I know there's nothing fundamentally wrong with Zero Retries content, hosting system, or domain name / provision, I will move forward on those tasks next week.

Next week's issue of Zero Retries - 0240 on 2026-02-27, will be the last that will be mentioned on Substack, where I'll put a Pinned Notification to find Zero Retries at www.zeroretries.radio (and a heads up about potential (invalid) security warnings).

Once again, thanks for your patience.

Post Publication Update on Zero Retries 0238 - Breaking - ARRL Begins to Consider Encryption in Amateur Radio

I added this to the above article on the [web version of Zero Retries 0238](#):

I received some thoughtful feedback on this article from a Zero Retries reader, resulting in this update. *I'm leaving the above verbiage with some incorrect points in place for comparison, since (in Ghost) I don't seem to be able to use strikethrough formatting.*

First... I mistakenly thought that [participation in ARES](#) was linked to ARRL membership, and thus ARES was exclusive to ARRL members.

ARES Membership Requirements

Every licensed amateur, regardless of membership in ARRL or any other local or national organization is eligible to apply for membership in ARES.

Second, I'm perhaps guilty of parsing Item 44 too pessimistically and saying:

I expect that a "secure forwarding" capability that's proposed as exclusive to ARES...

A less pessimistic parsing of Item 44 might translate to:

... by allowing secure forwarding of health and welfare messaging, especially for use in Amateur Radio *emergency communications*.

... of which the ARES program of ARRL is one of many entities that provide emergency communications training, and services, within Amateur Radio.

Given the context of an ARRL meeting in which all the participants have *longstanding* participation in ARRL, it may be that, in their minds, saying “ARES” is equivalent to saying “Amateur Radio emergency communications”.

My thanks to the Zero Retries reader that provided their candid feedback on this item. I truly appreciate such detailed and candid feedback to what I write in Zero Retries.

I'll Have a Table at Mike & Key Electronic Flea Market 2026

I will be attending the [Mike & Key Amateur Radio Club's 44Th Annual Electronics Show & Swap Meet](#) on **Saturday, 2026-03-07** in Puyallup, Washington, the biggest “hamfest” (not a conference - no presentations) in Western Washington. This year Tina and I will have a table to blow out some of the accumulated items that are now just taking up space in N8GNJ / Zero Retries Labs. See the [Zero Retries Store](#) for some items I'll be bringing, and more.

If you're planning to attend this event, I'll be hanging out at Table 2-S3 (presumably on the upstairs level of the venue). Please stop by and say Hi.

Weekends Are For Amateur Radio!

It worked out for a visit to our daughter and son in law this weekend in the Portland, Oregon area that I can attend the [Salem \[Oregon\] Hamfair](#) on Saturday 2026-02-21 in Rickreal, Oregon. I'm not attending in a quest for *anything* (quite the opposite in two weeks). But, it's always interesting, when getting out of one's area, and seeing a *new* set of Amateur Radio (and related) treasures being made available for low, low prices. 🤔

Have a great weekend, all of you co-conspirators in Zero Retries Interesting Amateur Radio activities!

*Please direct comments / feedback about **Request To Send** to the [Zero Retries email list with the #ZR0239 hashtag](#).*

Steve N8GNJ

Technological Innovation In Amateur Radio

By Steve Stroh N8GNJ

I had an interesting exchange with a long time Zero Retries reader who took mild issue with my characterization of various technological innovations occurring in Amateur Radio as actual (as in new) innovation. This reader had long experience in a particular network technology I've covered in Zero Retries, but in the context of government / military usage. Basically, much of what I'm portraying in Zero Retries for future innovations and networking... has long since already been done in government / military communications. I conceded the reader's point, *partially*, that *some specific technologies* might have already been developed and deployed... in government / military communications. One example is a data communications on system of the UK military - the [Bowman C4I system](#). It operates on VHF / UHF and features automatic mesh networking.

But I disagree with the reader's assertion, that in the bigger picture of Amateur Radio, that there's no actual innovation occurring, as in developing new technologies.

Bryan Hoyer K7UDR coined a term - *Amateurize* (which, unfortunately, I cannot find a specific online reference to, but the term really stuck in my mind.) The point he intended to make with that term was situations where Amateur Radio *recreates* existing technology, especially in networking, instead of using existing technology (unchanged) that is already proven.

But in my mind, there are times when "Amateurizing" a technology is a badge of honor, and *is* technological innovation. Some examples:

- (My favorite) - [Phil Karn KA9Q's NET and NOS](#) - a TCP/IP stack running on a typical PC running MS-DOS. This was groundbreaking at the time. At the time there was only one other such implementation (that I was aware of) by [FTP Software](#). One primary "Amateurizing" element of NET and NOS was that it could operate TCP/IP over slow 1200 bps half duplex networks (KA9Q added a "patient" mode in the NET and NOS TCP/IP stack) using a KISS TNC driver (another Amateurization). And, of course it was made available free (and KA9Q made the source code freely available). In all the critical aspects of TCP/IP, NET and NOS were totally compliant and interoperable.
- Digital Mobile Radio (DMR) wasn't designed to be usable worldwide via Internet interconnections between DMR networks. Amateurized elements for Amateur Radio use of DMR included low cost DMR repeaters thanks to [MMDVM](#), and keeping individual Amateur Radio DMR ID's unique thanks to the centralized database of [RadiolD](#). The (mostly unused, to date) potential of a single channel DMR repeater (one time slot is allocated to receive, the other to transmit), while not developed within Amateur Radio, may well find its greatest use in Amateur Radio.
- Amateur Radio Packet Radio was an Amateurization project that spanned multiple Amateur Radio groups in Montreal, Quebec, Ottawa, Ontario, Vancouver, British Columbia, and Tucson, Arizona. Packet (switching) radio data communications had been tested (expensively, and limited) as part of the ARPANet, and [ALOHAnet](#). Once microprocessors were available, Amateur Radio put them to use for a practical packet radio system for the requirements of Amateur Radio, such as reasonable cost and a modulation system that would work with typical VHF / UHF radios.
- Amateur Radio Microsats (Cubesats), dating back to the launch of [OSCAR 1](#) in 1961 were one of the first implementations of very small satellites that could be launched opportunistically on rockets whose primary mission was a large satellite.
- [Pico Balloons](#) combine a number of Amateur Radio innovations, including very lightweight payloads, the use of 100% solar power (no batteries - too much weight, too problematic in very cold temps in the upper atmosphere), the solar panels being just the panel, no backing (lightweight), and most importantly the use of a WSPR variant to transmit telemetry on Amateur Radio HF bands. This is only practical because of the [worldwide deployment of WSPR receiving stations](#).

I could spend weeks researching and documenting what would probably run to hundreds of such examples in which Amateur Radio adapted an existing technology to make it practical and popular to use in Amateur Radio.

And... of course, there is the reverse... where Amateur Radio technologies led to *commercial* products and even *entire companies*, such as:

- The Montreal packet radio experiments led to the [creation of DataRadio](#), which created one of the first “Mobile Data Terminals” for use in public safety. Instead of calling in a license plate check, a patrol officer could just type the license plate number into a keyboard and get a response without using a dispatcher. Notably, the earliest DataRadio terminals worked over typical VHF / UHF two way radio channels used by public safety (not cellular technology).
- Gerald Youngblood K5SDR created (what became) the [SDR-1000](#) as a series of articles in the QEX newsletter, which was so popular it led to the formation of FlexRadio Systems (the [Accidental Company](#)), which manufactures leading edge commercial and military radios.
- The success of the first network of Amateur Radio Packet Radio digipeaters in California inspired the creation of [Metricom](#) and the use of micronodes on streetlight poles.

There’s probably another book that could be written of examples of how Amateur Radio technologies led to commercial products and even entire companies.

Conclusion

I contend that ample Technological Innovation *is* occurring in Amateur Radio, and is relevant to the development of radio technologies whose benefits extend well beyond Amateur Radio.

Such information should be readily available for reference when someone says “Well, what good is Amateur Radio?” We in Amateur Radio need to be able to quickly cite such relevant examples, especially those that are contemporary.

Please direct comments / feedback about this article to the [Zero Retries email list with the #ZR0239 hashtag](#).

N8GNJ’s Top Three Priorities for Zero Retries Interesting Amateur Radio in the Next Three Years

By Steve Stroh N8GNJ

To keep issue length (more) reasonable, I’ve divided this long article into three consecutive installments.

- *Part 1, in [Zero Retries 0237](#) was summations of the inputs provided.*
- *Part 2, in [Zero Retries 0238](#) was a consolidation and synthesis of ideas into some broader themes for consideration of the Top Three Priorities for Zero Retries Interesting Amateur Radio in the Next Three Years.*
- ***This is Part 3, the conclusion.***

First, I’m grateful to all of those who offered inputs into this thought experiment. Many different perspectives were offered, many of which I had not considered.

To refresh, these were the broad themes I consolidated / synthesized in Part 2:

- **Amateur Radio Standards Organization (ARSO)**
- **Commercial Interest in Amateur Radio Spectrum**
- **Data Communications Emphasis, Mesh Networking, Newer Digital Voice Systems**

- **Emergency Communications (EMCOM)**
- **GEO Payload / Satellite for Western Hemisphere**
- **High Frequency (HF) Operation**
- **New Amateur Radio Organizations**
- **Primary References - Books, Web Page, Wiki for “I’m a Ham - *Now What?*”**
- **Regulatory Reform (Mostly, US)**

A tragicomic phrase from my last paycheck job comes to mind:

Get it all done first!

But of course, that’s not feasible for us small band of technological innovators, and especially me here in Zero Retries. So here’s the three items that I think are most important to focus on in the next three years, all the same priority:

- **Data Communications Emphasis, Mesh Networking, Newer Digital Voice Systems**
- **GEO Payload / Satellite for Western Hemisphere**
- **Regulatory Reform (Mostly, US)**

With a minor cheat of a fourth...

- **Primary References - Books, Web Page, Wiki for “I’m a Ham - *Now What?*”**

I think these *specific areas of focus* will have a significant positive impact on Amateur Radio in the next three years. Of course, this isn’t to say that anything else is unimportant, just, again, *these are the areas that I think that I and Zero Retries can focus on* to make a significant difference in Amateur Radio.

Data Communications Emphasis, Mesh Networking, Newer Digital Voice Systems

It’s easiest to quantify the impact of new data communications / mesh networking technology in Amateur Radio in the next three years given the amazing interest in Meshtastic, Meshcore, Reticulum, and other low bandwidth data communications systems used in unlicensed spectrum by technical hobbyists. With the much greater access to spectrum, especially in VHF / UHF and the ability to run higher power than what is possible (legal) in unlicensed spectrum, Amateur Radio data / mesh network systems *could* go far beyond the capabilities of Meshtastic / Meshcore. But... *could* isn’t the same as *will*. While Amateur Radio has ample potential, we haven’t yet realized that potential for next generation Amateur Radio data / mesh network systems. Thus providing renewed focus by me, and Zero Retries might yield some benefits to data / mesh network systems in progress such as:

- LinHT - a Software Defined Radio in a portable radio form factor,
- IP400 - a higher speed data communications system for the Amateur Radio 70 cm (420-450 MHz) band,
- “915 MHz” AREDN - use 802.11ah / Wi-Fi HaLow systems in AREDN networks.

GEO Payload / Satellite for Western Hemisphere

The QO-100 Amateur Radio payload in Geosynchronous Earth Orbit above the Eastern Hemisphere has provided a unique new capability for Amateur Radio Operators in that hemisphere. While not simple or inexpensive to access (requires 2.4 GHz uplink, and a 10 GHz downlink), it serves to link up widely dispersed Amateur Radio Operators that want to do “something different and experimental”, especially those located in rural areas.

A similar capability in the Western Hemisphere would, in my opinion, have much the same effect, allowing widely dispersed Amateur Radio Operators that want to do “something different and experimental”, particularly in much of Canada and Mexico, Amateur Radio Operators located West of the Mississippi River in the Continental US (ConUS), and those outside ConUS such as Hawaii. With the ubiquity of Internet, mobile networks, Starlink (especially the very inexpensive “Standby” service tier), it’s arguable that “high bandwidth” Amateur Radio experimentation over wide areas should shift to experimentation over existing networks. That’s a reasonable assertion.

But... **space, and satellites!** Given that Micro GEO satellites [now seem to be feasible as a turnkey product / service](#), this seems more feasible, technically and operationally, than ever. But... *not easy*, and it will be expensive in comparison to previous Amateur Radio satellites. Given the lack of public enthusiasm from AMSAT-US and AMSAT-CA for an Amateur Radio GEO after the [previous “big splash” of enthusiasm about a Western Hemisphere GEO](#), it’s going to take some significant evangelism, marketing, and just plain boosterism. And perhaps a new, dedicated organization whose singular focus is a Western Hemisphere Amateur Radio GEO.

There were three really encouraging developments in 2025 regarding a Western Hemisphere GEO:

- ARDC announced that **Space-Based Communications** is one of their three [Priority Areas for Funding](#):
Examples include Geostationary (or Highly Elliptical Orbit (HEO)) satellite programs.
What that means in practice (how big a check would ARDC be willing to write?) hasn’t been explored, but since the previous “big splash” *there hasn’t been an actual proposal for ARDC to consider*. Note that ARDC is a *funding organization, not an operational organization*, so while ARDC will provide funding, there’s no potential for an “ARDC GEO Satellite / payload”. Thus, perhaps a new organization is needed to create a proposal and an operational framework.
- [open.space](#) came out of stealth mode at Pacificon 2025 and unveiled their phased array 4.9–6.0 GHz **4-antenna SDR tile** (cluster of 4 units) that can be combined into an large enough array that’s claimed to be capable of Earth Moon Earth (EME) communications. Thus the “easy jaunt” to GEO (36,000 km) versus hitting Luna (385,000 km) with enough RF power to be reflected back to earth, seems easy. With enough scale of production, an Amateur Radio GEO earth station for, with 5 GHz earth station seems feasible. This is significant given that one of the development challenges named in the previous big splash was how to do a powerful enough 5 GHz uplink for an Amateur Radio earth station to be affordable.
- I was joined in this quest... this recognition of the importance of a Western Hemisphere Amateur Radio GEO satellite / payload by Cale Mooth K4HCK of Amateur Radio Daily and Amateur Radio Weekly. K4HCK published a manifesto - [Opinion: futureGEO is the Most Important Amateur Radio Initiative of this Decade. Why is no one Talking About it?](#). Amateur Radio Daily now hosts a resource page for this initiative - [futureGEO Resources](#). Until you see someone that you respect getting onboard a quest like this, you’re never quite sure if you’re just imagining that something is important, or you’re just early to such a realization. *With K4HCK’s interest and involvement*, this initiative is definitely the latter.

Regulatory Reform (Mostly, US)

When faster data communications systems that operate in Amateur Radio VHF / UHF spectrum are discussed with Amateur Radio Operators who aren't familiar with data communications, there is *always* sputtering, enthusiastic, pessimistic pushback "... **but... the FCC rules...**". And, in the letter of the law (current FCC Amateur Radio regulations), *they're right*.

Such issues are no longer just theoretically hampering technological innovation in Amateur Radio data communications. While New Packet Radio has offered higher speed data communications in the Amateur Radio 420-450 MHz band for years now, to date such systems have been a bit... fussy... to assemble given the requirement of a specific type of external amplifier needed to provide reasonable transmit power.

But Localino now offers the [NPR-H 3.0 \(70cm\)](#), a single unit New Packet Radio system for 420-450 MHz that transmits at 7 watts and can do 1 Mbps. But in the US, that unit can only be legally operated at a fraction of that full speed because of arcane FCC Amateur Radio regulations restricting "symbol rate" and maximum bandwidth for data communications. I've covered this issue extensively in Zero Retries so I won't rehash it here.

While the Localino NPR-H 3.0 (70cm) can at least be used in the US (in a "US restricted mode"), the new [Localino NPR-H 3.0 \(2m\)](#) *cannot be used at all in the US* as even the NPR "US restricted mode" cannot be used in the US 2 meter (144-148 MHz) band as the maximum bandwidth for 2 meters in the US is a mere 20 kHz, and NPR can only operate with a minimum of 100 kHz bandwidth.

Thus, *there's work to be done* if US Amateur Radio wants to realize newer, more innovative Data Communications Emphasis, Mesh Networking, Newer Digital Voice Systems in US Amateur Radio.

One immediate, early thing that can be done to (admittedly) "poke" the FCC, and make some progress about this issue is to apply for [Special Temporary Authority \(STA\)](#) or [Part 5 Experimental licenses](#) to actually use (test) NPR at full 1 Mbps speed on 70cm in the US, and also actually use (test) NPR at minimum and full speeds on 2m in the US. This approach has been used to established precedent for improved technology in Amateur Radio spectrum. In the previous decade, the ARRL would regularly apply for STAs to use high speed modems in the HF bands during hurricane season to provide for more efficient emergency communications in the Caribbean. The precedent developed from that series of STAs being granted was that *nothing bad happened from that variance from the current FCC Amateur Radio rules*. (And, as was pointed out regularly, no other country had such restrictions.) Eventually, the FCC Amateur Radio rules for HF data communications were updated. The FCC may well decline such STA / Part 5 licenses, but at minimum, they'll become aware, on some level, that technological innovation in Amateur Radio is being impeded by current FCC Part 97 regulations.

Now that these three initiatives have been identified, I'm going to create a resource / reference page, with subpages each, and provide regular updates to them. Now that I've identified what I should be working on... it's time to get busy on them.

Primary References - Books, Web Page, Wiki for "I'm a Ham - Now What?"

As for this initiative, it's not so much of a cheat of a *fourth of three initiatives*, this is more along the lines of recognition and "more deeply thinking" of a project that's been in the background of Zero Retries for years now. Mostly this will take the form of a book that I've been working on - **Zero Retries Guide to Amateur Radio in the 21st Century**, but also a number of variants of that information, such as ideas for academia and Science, Technology, Engineering, and Math (STEM) curriculums related Amateur Radio, a more formal treatment of technological innovation in Amateur Radio that can be easily referenced, and some other "information products" that I've identified as unique to Zero Retries.

Please direct comments / feedback about this article to the [Zero Retries email list with the #ZR0239 hashtag](#).

ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

Great Idea for Enhancing Geocaching With Amateur Radio

From Merideth Stroh KK7BKI:

Create a Geocache that when you find it, there's info for you to use your ham radio to make a call with a particular subaudible tone, which will trigger the receiving radio to send an automated pre-recorded transmission with a congratulations message.

Or, the reverse - in a localized area (such as a small park), upon seeing a sign, use your ham radio to make a call with a particular subaudible tone, which will transmit an automated pre-recorded transmission that provides coordinates to find a geocache.

[Geocaching](#) is a fun family activity and we enjoyed checking out a few geocaches when daughter Merideth (yes, I'm a very proud Dad) was younger. We even did it with a basic GPS receiver (just displayed Lat / Long / Altitude) once we got into the general area of a geocache. This idea seems to me have a lot of potential for generating some interest in Amateur Radio from geocache participants.

Using AI, I can imagine that there could be a rotating list of funny voice messages using some recognizable voice types, such as a deep, gravely voiced cowboy, or... one's imagination is limitless. Each one could be a brief snippet of info about Amateur Radio:

- *Did you know that there are **two** Amateur Radio stations about the International Space Station?*
- *Morse Code is a cool secret language (that your parents won't understand what you're saying).*
- *Anyone can become an Amateur Radio Operator - no minimum age!*
- *With your Amateur Radio license, you can use your Raspberry Pi computer to send signals around the world!*

Or, perhaps this is a way to generate more activity for a too-quiet Amateur Radio repeater.

A quick web search didn't find any hardware that has this specific capability, so perhaps there's an opening for a small Amateur Radio manufacturer for a new product!

Kudos to KK7BKI for this great idea!

[MOP - Mesh Operations Protocol](#)

Post Publication Update 2 - It's back!

Post Publication Update 1 - Sadly, the MOP page is no longer available (and darn it, I didn't snapshot it into the [Wayback Machine](#); I really gotta get into that habit when I see really interesting pages like that). I don't know the reason. I've reached out to KO6IKR that I hope he brings it back.

Stan Slonkosky KE6ZC alerted me to this new development:

I have not studied this enough to understand all of what is going on here as I just found out about it. Stefaan Desmedt KO6IKR, is working on what he calls his Mesh Options Protocol. Currently, he is working on an open source software modem that could be used instead of VARA FM.

From the MOP website:

A decentralized mesh network for amateur radio.
No sessions. No hubs. No closed-source software.
Just datagrams and beacons — short, efficient bursts.

- 4800 bps
- Custom 4-FSK
- 0.6s TX TIME — 200B MESSAGE
- 0 Central Servers Required

Why We Built This

Many existing amateur radio data systems behave like “phone calls.” MOP is built for short bursts, broadcast reach, and mesh forwarding.

GitHub page:

<https://github.com/smashingwaffle>

I could try to explain this, but the web page linked in the title is an *absolute marvel of self-explanation*. **It's really amazing!** Scroll down to see the sections **Live Network Simulation**, **Cross-Country Delivery**, and **MOP vs. The Rest**. Read those, and you're up to speed on the ideas of MOP.

One thing that leaps to mind is “*only 4800 bps*”? But when you look at that 0.6s TX time for a 200 byte message, and the simplicity of a modulation method that combines reasonably fast and reasonably robust, and the ability to scale the mesh because the collision domain is large, but the potential for collisions are reduced, and you think *hmmm, yeah, I get it the design tradeoffs*.

But what's really to love is that MOP incorporates a new clean sheet of paper implementation of *mesh networking*! I had actually started a story in this issue, but didn't complete it, positing that the era of high profile Amateur Radio nodes might be drawing to a close because high profile sites are increasingly “going *very corporate* (expensive, with increasingly fussy requirements)”. That article would also make a case that we now have ample capacity to implement decentralized, automatic mesh networking... *like MOP*.

MOP, as proposed, has significant potential to give Amateur Radio a compelling capability that exceeds the utility of Meshtastic / Meshcore. For one, you can use a semi-typical (needs a flat audio connection for the higher order modulation) VHF / UHF radio which can generate significant RF power (50 watts isn't unusual) for longer range / higher reliability.

One thing I'd love to see in MOP (but haven't looked, haven't contacted the author) is a multi-node capability, where you could “stack” different band radios - 2m / 1.25m / 70cm, even 6m and 33cm, for inter-band routing.

I could easily see MOP integrated into a small, efficient black box radio with just three connections - USB for host access (which could be used to add Ethernet or Bluetooth), antenna, and power.

[Quantum SDR Project](#)

Michael Papp WB6GJE alerted me to this new development!

From the website:

The Quantum SDR Project has one core aim: to develop exciting and novel radio technology that's more affordable for our members.

Small steps, first the Spectrum pan adapter with day-bright high resolution touch screens, HF-VHF all-modes receiver, digital modes WiFi and AI-based features such as a VUI (Voice User Interface)!

The QCom ultra-portable SDR transceiver is now available, with 0.1-20 watts of efficient TX power giving a global reach!

The first product launched in June 2023 was the Quantum Spectrum DSP M2, an affordable touch display that offers advanced Digital Signal Processing for all radios new and classic, providing a full 192/138 KHz band view and Slip-tune™ independent tuning.

Unlike the MOP project (previous story), the Quantum SDR Project isn't very clear about what it's actually offering. For example, I couldn't find any significant info (specs) on the "QCom ultra-portable SDR transceiver" on the website - not even a photo. But it does seem to be real hardware - see the video:

The "Store" tab has you fill out contact info. Etc. Actual dates for delivery aren't stated (next month). This seems to be a US company - [buried in the "Legal" tab](#).

It all sounds pretty interesting and ambitious, but I think I'm going to reserve my enthusiasm to see if they reach out to some reviewers with some actual hardware.

Video - Tech Minds Ft2 Is The Fastest Digital Mode Ever Created!

As quickly becomes obvious, "fastest" isn't a reference to data speed, it's actually a reference to reduced transmission time. I found a better explanation, written by Martino Merola IU8LMC, FT2's developer: [New Digital Mode: FT2](#):

FT2 is not a theoretical concept. It is fully working software, tested and operational.

On February 16, 2026, we successfully completed dozens of real contacts in FT2 mode, with transmission cycles of 3.8 seconds — four times faster than FT8 and twice as fast as FT4. QSOs were verified on two bands (40 meters and 80 meters) with stations in Campania, Capri, Sardinia, and Turin. Signals were successfully decoded down to -12 dB signal-to-noise ratio.

FT2 uses the same codec as FT8 and FT4: 77-bit payload, LDPC (174,91) encoding, 8-GFSK modulation. The only difference is the time compression: shorter symbols, cycle reduced to 3.8 seconds. The result is a complete QSO in 7-11 seconds, compared to the full minute required in FT8.

This mode was conceived and developed by IU8LMC, with the support of the ARI Caserta Team. Artificial intelligence was used as a development tool to assist with modifications to the WSJT-X source code.

The Time vs Bandwidth vs Sensitivity chart shows the engineering trade-off behind FT2: at 3.8 seconds with 150 Hz bandwidth, sensitivity is approximately -12/-13 dB. Less sensitive than FT8, but more than sufficient for contests, DXpeditions, and pile-ups where signals are strong.

FT2 does not replace FT8 or FT4. It is a specialized mode for when pure speed is what matters.

Video - Ham Radio Keyboard-to-Keyboard Options!

How exactly do data modes work? What's the difference between Frequency and Phase shift keying? Why do we use different techniques to modulate data into radio waves? Is there a single best mode for data/keyboard communication?

Craig Lamparter KM6LYW (always!) does a good job of a basic description of various types of data modes in this video. KM6LYW Radio is one of the first videos I see when I bring up my [Zero Retries YouTube channel](#).

Video - AREDN Networking Software Update ~ 02/11/2026

RATPAC is really on a roll so far this year with some [great Zero Retries Interesting presentations!](#)

Every Amateur Radio project needs an Ambassador like Orv Beach W6BI!

[MSeven-M17 App for iPad](#)

Tom Salzer KJ7T in his always great newsletter, **Random Wire 170**:

I tested MSeven on my iPad Mini where it is working great. It should also work on an iPhone (although your phone must be running iOS 26.0 or newer — my phone is too old). Here's the description in the Apple App Store:

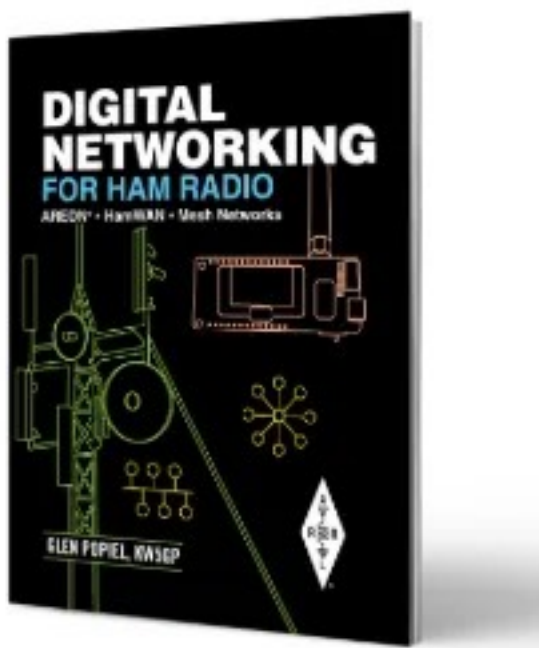
I can't do a better job than KJ7T does about this app, so just click on the link in the title to go to it. I'm constantly learning new things about Amateur Radio Over Internet from Random Wire newsletter and now [EtherHam.com](#) and it's *so much fun* to be able to read such distilled wisdom on the subject!

I have the same problem with my iPad as Tom does with his iPhone, so I'll have to try this out on my (newer) iPhone.

ARRL's Digital Networking for Ham Radio Book Now Shipping

ARRL Letter for 2026-02-19 by John Ross KD8IDJ:

New Book Release: *Digital Networking for Ham Radio*



ARRL's new book, [*Digital Networking for Ham Radio*](#), a practical, hands-on guide to designing and implementing high-speed data networks for amateur radio stations, is now shipping.

Written by Glen Popiel, KW5GP, the book brings together in one comprehensive resource the knowledge needed to build, configure, and expand digital networks for ham radio. From TCP/IP fundamentals to deploying mesh technologies such as AREDN®, HamWAN, and Meshtastic®, readers will find clear explanations and step-by-step guidance.

“When I began experimenting with amateur radio data networking, I realized there wasn’t a single resource that clearly explained how it all works — especially TCP/IP in terms the average ham could relate to,” said Popiel. “That inspired me to create a practical guide to designing and implementing high-speed amateur radio networks. Since there’s no speed limit above 70 centimeters, operators can integrate webcams, IP phones, and other networked devices. I hope this book encourages hams to explore, experiment, and enjoy networking on the microwave bands.”

[*Digital Networking for Ham Radio*](#) covers selecting hardware, choosing network topologies, configuring systems, and staying compliant with FCC Part 97 rules. The book is designed for both newcomers and experienced operators who want to expand their stations with resilient, high-speed networking capabilities.

Digital Networking for Ham Radio is now shipping. Order from the ARRL [online store](#) or through an ARRL [publication dealer](#). ARRL Item No. 2349, ISBN: 978-1-62595-234-9, \$29.95 ARRL member price, \$34.95 retail.

For additional questions or ordering, call 1-888-277-5289 toll-free in the US, Monday through Thursday 8 AM to 7 PM and Friday 8 AM to 5 PM Eastern Time. Outside the US, call (860) 594-0200.

*Please offer comments / feedback about **ZR > BEACON** on the [Zero Retries email list with the #ZR0239 hashtag](#).*

Closing Thanks

My ongoing **Thanks** to:

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